DOCUMENT RESUME

ED 269 398 SP 027 582

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TITLE Context Variables That Affect Measures of Teacher Efficacy.
PUB DATE Apr 86
NOTE 28p.; Paper presented at the Annual Meeting of the American Educational Research Association (70th, San Francisco, CA, April 16-20, 1986).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; *Outcomes of Education; *Self Evaluation (Individuals); *Teacher Attitudes; *Teacher Effectiveness

ABSTRACT

This paper presents a model describing three context variables hypothesized to affect measures of teacher efficacy. These variables include the nature of the student performance outcome (positive or negative), the ability of the students involved (high or low), and the scope of influence (single student or group of students). The results from studies investigating the influence of performance outcomes and student ability on teachers' perceptions of efficacy are summarized. The present study explored the extent of the effect of influence on the teachers' perceptions. It was discovered that teachers do distinguish in their perceptions of efficacy between results with a single student and those with a group of students. When poor performance was involved, teachers expressed less personal responsibility and efficacy for single students than for results from a group of students. A four-page list of references is included. (Author/CB)

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CONTEXT VARIABLES THAT AFFECT MEASURES OF TEACHER EFFICACY

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Paper presented at the annual meeting of the
American Educational Research Association,
San Francisco, 1986.

CE042582

Abstract

This paper presents a model describing three context variables hypothesized to affect measures of teacher efficacy. These variables include the nature of the student performance outcome (positive or negative), the ability of the students involved (high or low), and the scope of influence (single student or group of students). The results from studies investigating the influence of performance outcomes and student ability on teachers' perceptions of efficacy are summarized. The present study focuses on the scope of influence and offers evidence of its importance to the model.

Context Variables That Affect Measures of Teacher Efficacy

Over the past decade a growing number of educational researchers have identified teachers' perceived responsibility for student achievement or personal sense of efficacy as a powerful variable in studies of instructional effectiveness. In reporting on the Rand Corporation's "Change Agent Study," for example, McLaughlin and Marsh (1978) note that teachers' sense of efficacy was "the most powerful teacher attribute in the Rand analysis" (p. 84). Armor, Conroy-Osequera, Cox, King, McDonnell, Pascal, Pauly, & Zellman (1976) reached a similar conclusion in their study of reading programs in Los Angeles. Their findings showed measures of teacher efficacy were strongly and consistently related to student gains in reading achievement. Likewise, Brookover and Lezotte (1979) found through interviews with school personnel that those in more effective schools had a stronger sense of efficacy and tended to feel more responsible for the learning of their students than did those in less effective schools. Other studies investigating this construct have yielded comparable results (Brophy & Evertson, 1977; Murray & Staebler, 1974; Porter & Cohen, 1977).

Although modern definitions of teacher efficacy vary, most can be traced to the early research of Heider (1958) or White (1959). In the Rand study, efficacy was defined as "the extent to which the teacher believes he or she has the capacity to affect student performance" (McLaughlin & Marsh, 1978, p. 84). In general, it is seen as a teacher's belief or conviction that he or she can influence how well

students learn, even those who may be difficult or unmotivated. Gibson and Dembo (1984) argue it may be necessary to further distinguish general teaching efficacy from personal teaching efficacy, as suggested by Bandura's (1977, 1978) conceptualization of self-efficacy. That is, teachers may believe that certain practices or teaching behaviors will affect student performance (general) but, at the same time, may not believe they can perform those necessary activities (personal).

Early studies of teacher efficacy measured this construct with scales consisting of as few as two items (Berman & McLaughlin, 1977; Armor et al., 1976). But in recent years, several well-designed instruments have been developed to measure teacher efficacy with greater accuracy and reliability (Gibson & Dembo, 1984; Guskey, 1981a; Rose & Medway, 1981). Investigations employing instruments such as these have been concerned with the relation of teacher efficacy to student learning (Guskey, 1984; Porter & Cohen, 1977), to other teacher characteristics and classroom behaviors (Ashton & Webb, 1982; Gibson & Dembo, 1984; Guskey, 1981b), or to the general attribution assignments teachers make (Guskey, 1982). But while it has been noted that teacher efficacy is likely to be dependent upon certain context variables (Ashton, 1984), few investigations have sought to determine the nature of these variables or their precise effects on measures of teacher efficacy.

This paper presents a model describing three context variables that are hypothesized to affect measures of teacher efficacy. It is argued that instead of representing a single global construct, efficacy is multidimensional and that these context variables represent dimensions of that construct. The results of research studies investigating two of

these context variables are outlined in detail. In addition, the results of a study focusing on a third variable are described which add credence to its importance to the model.

Theoretical Framework

Previous research has shown two context variables to have strong influence on measures of teacher efficacy. One is the nature of the student performance outcome being considered. Numerous studies have demonstrated that there is little relation between the efficacy or responsibility teachers assume for positive learning outcomes versus that which they assume for negative learning outcomes. In the Rand study, for instance, Berman and McLaughlin (1977) found the correlation between the two efficacy items, one of which was positive while the other was negative, to be very modest. In fact, in only one of six samples did this correlation even reach statistical significance. Similarly, in developing the Responsibility for Student Achievement scale (RSA), Guskey (1981a) found the correlation between perceived responsibility for positive versus negative classroom events to be only +.20. This was seen as evidence that these two dimensions are relatively independent, similar to what Crandall, Katkovsky, and Crandall (1965) found in investigating childrens' perceptions of personal control in achievement related situations. Rose and Medway (1981) found the same pattern in developing their Teacher Locus of Control scale. In this research a correlation of only +.33 was found between items measuring internal attributions for student success and those measuring internal attributions for student failure.

Investigations seeking to explain these differences have yielded inconsistent results. For example, Johnson, Feigenbaum, and Weiby (1964) found that in a laboratory teaching task, teachers tended to make "defensive" attribution assignments, accepting responsibility when students did well but blaming the situation when students did poorly. In a similar study, Beckman (1970) also found that teachers tended to credit themselves for student improvement while attributing failure primarily to external situational factors. Yet in a number of other studies teachers have been found to make "counter-defensive" attributions. Ross, Bierbrauer, and Polly (1974), for instance, found that professional teachers attributed responsibility for student failure to themselves and responsibility for success to the student. Similar nondefensive perceptions on the part of teachers have been identified in the research of Ames (1975), Beckman (1973), and Tetlock (1980).

An explanation for these inconsistencies was offered in a study by Brandt, Hayden, & Brophy (1975). They suggested that when subjects are dependent totally on data from experimenters, as they are in laboratory experiments like that of Johnson, et al. (1964) and Beckman (1970), more defensive reactions are likely to result. In contrast, when subjects are given an opportunity to meet students personally and deal with them at length, their reactions are more likely to be more nondefensive. In other words, in more naturalistic situations teachers are far less self-serving and defensive than some of the purely experimental studies make them out to be. Still, it is clear that the nature of the student performance outcome, specifically whether that outcome is positive (success) or negative (failure), influences teacher perceptions of efficacy and the measure of those perceptions.

A second context variable found to affect measures of teacher efficacy is the ability of the students involved. Research on the classroom behaviors of teachers shows there are unintentional, qualitative differences in the way teachers interact with high ability students versus low ability students. Generally, teachers have been found to teach more to students labeled "high ability" than those labeled "low ability," and are more attentive toward children labeled "bright" than toward those labeled "dull" (Brophy & Good, 1974; Rothbart, Dalfen, & Barrett, 1971). Studies have also shown these behavioral differences to be associated with efficacy or personal responsibility differences. Cooper and Lowe (1977) reported that teachers perceive smart students as more personally responsible for classroom successes. Dull students, on the other hand, are perceived as more personally responsible for classroom failures. In a related study, Cooper, Burger, and Seymour (1979) found these perceptual differences to be the result of teachers feeling they have less control over low ability students and, therefore, are less able to influence how well they learn. A study by Medway (1979) also confirmed student ability to be an important mediating variable in the responsibility and attribution assignments of teachers.

As a context variable, student ability is also tied to teacher expectations and consistency in the performance outcome. Typically, high ability students would be expected to perform well, while low ability students might be expected to perform poorly. In other words, consistency in performance is generally what is expected. Departures from these expected outcomes; that is, high ability students doing

poorly or low ability students doing well; are likely to have definite effects on teachers' perceptions of efficacy or personal responsibility. But rather than presenting separate, distinct factors, these can be represented as special combinations of performance outcomes with student abilities. Hence, it seems likely that the performance outcome and student ability variables may have not only direct, but also interactive influences on measures of teacher efficacy.

A third context variable hypothesized to affect measures of teacher efficacy is the scope of influence. Scope refers to the narrowness or broadness of the teachers' influence. Specifically, it has to do with differences in teachers' beliefs about their influence over the learning of a single student versus that of a group or entire class of students. Studies have shown that teachers do distinguish between results with individual students and results from a group of students. Lortie (1975), for example, found in his study of Five Towns that the predominant source of pride for most teachers was striking success with one student here and one student there, as distinct from raising the achievement level of an entire group of students. In fact, when asked about the major source of their satisfaction, 64 percent of the Five Town teachers mentioned successes with a single student while only 29 percent mentioned group results. It seems probable that teachers would make similar distinctions in measures of efficacy. In particular, it was thought teachers would express greater efficacy when asked about the learning of a single student than when asked about a group or class of students. The management problems inherent in group-based teaching situations often limit the direct influence and control teachers have

over learning. With a single student, however, management problems are far less pressing and do not interfere with the influence a teacher can have.

Figure 1 illustrates the dimensions of these three context variables. Each variable is shown to have only two levels, although finer gradations are undoubtedly possible in all three. Again, these include: (1) the performance outcome, which can be either positive or negative; (2) student ability, which can be either high or low; and (3) scope, which can refer to either a single student or a group of students. The importance of the performance outcome and student ability variables appears fairly well documented. The purpose of this study was to investigate the relevance of the scope variable.

Insert Figure 1

Method

To determine the effects of the outcome scope variable on measures of teacher efficacy, a revised version of the Responsibility for Student Achievement scale (Guskey, 1981a) was devised. This scale provides separate subscales for positive (RP) and negative (RN) performance outcomes (reliability coefficients = .79 and .88, respectively) but does not distinguish between outcomes obtained with high versus low ability students. From the original 30 items in the scale, the ten most discriminating items from both the positive and negative subscales were

selected. Five items from each of these two groups of ten items were then reworded to clearly reflect a learning situation involving a single student; the other five items clearly reflected a learning situation with a group or entire class or students. Care was also taken to make sure half of the single student items referred to a female student and the other half to a male student. Items were then randomly ordered in a new version of the scale.

The Responsibility for Student Achievement scale employs an alternative-weighting procedure in which respondents are asked to assign a certain percent of weight to each of the two responses, totalling 100 percent. For example, one item asks: "If you don't have as much success as usual with a particular class, is that probably (a) because you didn't plan as carefully as usual, or (b) because these students refused to work as hard as others?" This item reflects a negative performance outcome with the scope focused on a group of students. The percentage weight assigned to response (a), the more personally responsible or efficacious response, is then tallied. For the purposes of this study, response weights were reduced to a 0-10 rating and then averaged across items in that subscale.

The revised scale was then administered to a group of 120 elementary and secondary school teachers from three school districts. One of these districts was an urban, inner city district, the second was a suburban district, and the third was a rural district. These teachers were all participating in a special staff development program for which they received salary lane credit. Forty-six of these teachers were male; 74 were female. On the average they had 11 years teaching experience.

With the revised Responsibility for Student Achievement scale, these teachers also completed two additional scales. The first was a scale designed by the author to assess affect toward teaching; that is, how much teachers like teaching and how positively or negatively they feel about various aspects of teaching. This scale contains 30 Likert-type items, most of which were adapted from items in the Self-Observational Scales (Katzenmeyer & Stenner, 1974). Each item in this scale asks teachers to indicate their feelings regarding a particular statement. Five options are available for the rating, ranging from Strongly Disagree to Strongly Agree. Statements are both positive and negative. For example, a positive item would be, "I enjoy learning about new classroom techniques," while a negative item would be, "I often get bored in discussions about education." The weights that are assigned response options for positive items are reversed in tallying responses to negative items. An average response across items is then calculated so that scores can range from 1 to 5. Pilot testing of this scale showed it was fairly reliable, with a Cronbach alpha coefficient equal to .85.

The second scale, also developed by the author, assessed teaching self-concept. Like the affect toward teaching scale, this scale consists of 30 Likert-type items. These items are all behavioral-based, self-concept items, similar to those developed in the research of Brookover (1973). Each item asks teachers to indicate their feelings in relation to particular behaviors or characteristics relevant to teaching. Items are both positive and negative, and are rated on a five-point scale from Strongly Disagree to Strongly Agree. An example

of a positive item would be, "I am very proud of my performance as a teacher," while a negative item would be, "I sometimes have doubts about the effectiveness of my teaching." Again, an average response across items is then calculated so that scores range from 1 to 5. Pilot testing of this scale showed it also to be fairly reliable, with a Cronbach alpha equal to .84.

Finally, a general measure of efficacy was gathered using the two efficacy items from Berman and McLaughlin (1977). Responses to each of these items were recorded separately along with a total combined efficacy score.

Results

Of the 120 teachers participating in the study, six either did not complete the instruments or recorded their responses in such a manner that they could not be used. Therefore, analyses were based on complete data gathered from a total of 114 teachers.

The means and standard deviations of measures from the various scales are illustrated in Table 1. Since other studies have indicated that grade level differences among teachers can influence their beliefs in responsibility and efficacy (Guskey, 1982), a breakdown of means and standard deviations by grade level groupings was also constructed. This is displayed in Table 2.

Insert Tables 1 & 2

These data show that the perceptions of personal efficacy among this group of highly experienced teachers tended to be defensive in nature. That is, these teachers expressed significantly greater personal efficacy when the performance outcome was positive (RP measures) than when it was negative (RN measures). In addition, these data show that outcome scope is also influential, but only when the performance outcome is negative. There was no difference in the personal efficacy expressed by these teachers for positive results with single students or groups. But the personal efficacy they expressed for negative outcomes with single students was significantly different from that expressed with groups of students. Counter to what was hypothesized, however, these teachers expressed greater personal efficacy for group results than for those involving only a single student.

Dividing the teachers by grade levels showed that response patterns remained fairly constant across grade assignments with little difference between the various levels. The only exception was the personal efficacy expressed by high school teachers for negative outcomes with a single student (RN Single), which was less than that expressed by any other group.

The intercorrelations among these variables are shown in Table 3. Here it can be seen that neither years experience nor grade level assignment are significantly related to any of the other variables in the study. Inspection of the intercorrelations among the various dimensions of the efficacy context variables shows an interesting pattern, however. The correlation between the positive/group and negative/group dimensions is +.33, similar in both direction and

magnitude to what other researchers have found between efficacy measures for positive versus negative performance outcomes. But the correlation between the positive/single and negative/single dimensions is only -.03, indicating that there is no relation between these dimensions. In other words, the responsibility or personal efficacy a teacher assumes for the learning success of a single student is unrelated to the responsibility or efficacy that teacher assumes for a single students' lack of success or failure. Correlations between single and group dimensions for outcomes similar in nature are moderate: +.48 for positive outcomes and +.70 for negative outcomes.

Insert Table 3

The relationships between the various dimensions of the efficacy context variables and the two efficacy items taken from the research of Berman and McLaughlin (1977) are what one would anticipate. The first item, which states "When it comes down to it, a teacher really can't do much because most students' motivation and performance depends on their environment," would be classified as a negative/group item. As illustrated in Table 3, responses to this item are more strongly related to the negative/group dimension (r=+.48) than any other dimension. The second item, on the other hand, states "If I really try hard, I can get through to even the most difficult or unmotivated students." This statement would be classified as positive/single and, again, is more

strongly related to that dimension than any other (r=-.38)*

The intercorrelations among the affect toward teaching and teaching self-concept scales, and the various dimensions of the efficacy context variables, also reveal an interesting pattern. Both affect and self-concept are more strongly related to the group dimensions of efficacy than to the single student dimensions. This holds true for both positive and negative performance outcomes. Apparently how much teachers like teaching and how confident they feel about their teaching abilities are more closely tied to the personal efficacy they assume for the performance of groups of students than to that of a single student. Hence, while success with a single student may bring pride and satisfaction (Lortie, 1975), it appears that teaching affect and teaching self-concept are more closely tied to perceptions of efficacy regarding group results.

Finally, a factor analysis was conducted on the revised Responsibility for Student Achievement scale. The results from this analysis are illustrated in Table 4. To simplify interpretation, items have been grouped in the table by the dimensions of the context variables they were designed to assess. Three factors were derived in the analysis with eigenvalues greater than one. From the table it can be seen that the first factor appears to capture the negative performance outcome dimension. All of the negative outcome items loaded most heavily on this factor. The second factor appears to capture the positive performance outcome dimension. With only one exception (item #15), the positive outcome items loaded most heavily on this factor.

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* The negative sign is due to the reverse scaling of this item.

These results provide still further evidence that positive and negative performance outcomes represent separate dimensions, operating independently in their influence on perceptions of efficacy.

Insert Table 4

While it was anticipated that the third factor might identify some dimension of scope, this was not verified. As the table shows, the loadings on the third factor are mixed and inconsistent across items. Inspection of the items in relation to these loadings could not identify any specific characteristic that might typify this factor or help to label it.

Discussion

This paper sought to explore the affects of specific context variables on measures of teacher efficacy. Results from previous efficacy research was reviewed to illustrate the influence of two variables: performance outcome and student ability. This evidence showed that teachers' perceptions of efficacy do vary depending upon whether the performance outcome is positive (student success) or negative (student failure), and whether the students involved are of high or low ability. In the present study a third variable, the scope of influence, was explored to determine the extent of its affect on teachers' perceptions of efficacy and the measure of those perceptions.

It was discovered that teachers do distinguish in their perceptions of efficacy between results with a single student and those with a group of students, but that these perceptions differ significantly only when the performance outcome is negative. When poor performance was involved, teachers expressed less personal responsibility and efficacy for single students than for results from a group or entire class of students. Poor performance on the part of a single student was generally attributed to situational factors outside of the teachers' control. It was also discovered that teachers' feelings of affect toward teaching and teaching self-concept were more strongly related to personal efficacy for group results.

Although these findings are counter to what was originally hypothesized, they are quite reasonable. The management problems associated with classroom settings may restrict teachers' influence and control to some degree. Still, it is clear that the teacher is (or can be) the major causal agent of group-based results. While the experienced teachers included in this study did not see themselves as the major source of influence when students did poorly, they did accept significantly greater personal responsibility when the results from an entire group or class of students were poor, compared to when only a single student did poorly. It seems these teachers perceived the individual learning problems experienced by some students as particularly difficult to influence through their personal effort or pedagogical skill.

The generalization of these results is limited to some degree by the nonrandom nature of the sample of teachers included. Still, it is

believed that strong evidence has been presented to support the notion that teacher efficacy is a complex and multidimensional construct. Among the context variables that affect teachers' perceptions of efficacy, performance outcome and student ability appear to have both direct and interactive effects. The results from the present study indicate that the affect of scope of influence may be primarily interactive, depending upon the nature of the performance outcome.

Teacher efficacy is likely to continue to be a potent construct in studies of instructional effectiveness. By considering the context variables that affect measures of teacher efficacy it is hoped we will gain a better understanding of this construct and its influence on the teaching and learning process.

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Table 1

Means and Standard Deviations of Various Teacher Measures (n=114)

Variable	Mean	Standard Deviation
Years experience	11.80	7.69
Grade level	4.93	3.28
RP Single	6.09	1.05
RP Group	6.29	1.20
RN Single	4.29	1.63
RN Group	5.71	1.59
Efficacy 1	4.01	.91
Efficacy 2	2.06	.85
Efficacy	3.97	.73
Affect Toward Teaching	4.04	.45
Teaching Self-Concept	3.82	.49

Table 2

Means and Standard Deviations of Teacher Measures by Grade Level

Variable	Grades K-3 (n=37)		Grades 4-6 (n=27)		Grades 7-8 (n=31)		Grades 9-12 (n=19)	
	X.	(sd)	X.	(sd)	X.	(sd)	X.	(sd)
Yrs. Exp.	10.93	(8.97)	12.80	(8.20)	13.09	(4.88)	15.36	(8.13)
Grade	2.54	(.74)	5.05	(.76)	7.78	(.42)	9.79	(.80)
RP Single	6.24	(1.07)	6.23	(1.13)	5.91	(.99)	6.39	(1.05)
RP Group	6.64	(1.08)	6.45	(1.22)	5.90	(1.35)	6.41	(1.14)
RN Single	4.81	(1.64)	4.05	(1.67)	4.40	(1.79)	3.60	(1.44)
RN Group	6.29	(1.57)	5.48	(1.64)	5.74	(1.72)	5.47	(1.53)
Efficacy 1	4.11	(.83)	3.95	(1.13)	4.00	(.80)	4.36	(.63)
Efficacy 2	1.82	(.82)	2.16	(.76)	2.00	(.80)	2.00	(1.04)
Efficacy	4.14	(.73)	3.89	(.76)	4.00	(.67)	4.18	(.70)
Affect	4.10	(.36)	4.04	(.49)	4.11	(.40)	4.09	(.70)
Self-Cncpt	3.89	(.37)	3.83	(.61)	3.86	(.55)	3.92	(.56)

Table 3

Intercorrelations Among the Variables
(n = 144)

Vars	Yrs	Grd	RPS	RPG	RNS	RNG	Eff1	Eff2	EFF	AFF	SC
Yrs	1.00										
Grd	.14	1.00									
RPS	.02	.01	1.00								
RPG	-.09	-.03	.48	1.00							
RNS	-.02	-.14	-.03	.17	1.00						
RNG	-.10	.05	.18	.33	.70	1.00					
Eff1	.09	.12	.24	.27	.35	.43	1.00				
Eff2	.01	-.02	-.29	-.38	-.21	-.32	-.37	1.00			
EFF	.05	.09	.32	.39	.34	.45	.81	-.82	1.00		
AFF	.08	.09	.20	.27	.22	.30	.51	-.39	.55	1.00	
SC	.15	.10	.22	.25	.19	.24	.47	-.37	.51	.69	1.00

Table 4

Item Factor Analysis Results

Item	Factor 1	Factor 2	Factor 3	Commuality
RP Single				
1	.069	.460	.007	.536
7	.171	.448	.576	.803
11	.089	.308	-.064	.521
14	.341	.361	-.361	.648
17	.099	.544	.162	.700
RP Group				
4	.278	.413	.004	.484
5	.319	.566	-.135	.735
15	.268	.082	-.415	.404
16	.275	.373	-.178	.640
19	.287	.514	.054	.611
RN Single				
2	.625	-.136	-.185	.715
3	.485	-.344	.229	.631
9	.513	-.355	-.110	.701
10	.596	-.111	.239	.635
12	.652	-.313	.191	.914
RN Group				
6	.569	.031	.084	.645
8	.592	-.238	-.291	.803
13	.611	-.104	.221	.760
18	.713	.023	-.014	.841
20	.699	-.008	-.008	.687
Eigenvalue	4.294	2.276	1.051	

Figure 1

Context Variables Affecting Measures of Teacher Efficacy